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Dog Assisted Activities and Their Effect on the Depression of Elementary Students

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Abstract

The study took place in a Greek elementary school and the aim was to examine the effect of a Dog Assisted Activity (DAA) programme on the students' depressive symptomatology. The researchers' hypothesis was whether the interaction of the students with a trained dog will affect their depression symptomatology; measured via a self-completed questionnaire. The control group (n = 25) attended lectures on dog training while the experimental group (n = 19) interacted with a trained dog. There were two measurements: before, and immediately after the intervention. The DDA programme was granted ethical approval as appropriate and designed so as to prioritise the health, safety and welfare of both the participants and the dog. The data collected was analysed in SPSS and the results indicated a significant decrease in the experimental group student's depression scores (p = .018). The researchers acknowledge the existence of multiple factor that may contribute to the decrease of depression and certain study design limitations which may affect the generalisation of the results. However, the present study's results suggest that DAA programmes may potentially have a positive effect on the psychological well-being of elementary school students. According to the researcher's knowledge, that was the first study conducted in Greece examining the effect of a DDA programme on the depression of elementary students. Therefore, further research and study are needed in this area to get a better understanding and reach safer conclusions.

Keywords

Dog Assisted Interventions, Dog Assisted Activities, Students' Depression

1. Introduction

According to the World Health Organization (2023), depression is a mood dis-

order that most commonly causes a persistent feeling of sadness and loss of interest. Depression is not only evident in adults but can also be experienced by school-age children and adolescents. The diagnosis of depression as an individual psychological problem is very difficult, as in the vast majority of cases it is connected with other coexisting psychological issues (Bignardi et al., 2021; Kleftaras, 2004; Kleftaras & Alexopoulos, 2015; Kleftaras & Didaskalou, 2006; Madhukar, 2020; Tannous, 2011).

Over the last 30 years the scientific community, among others, has been studying the beneficial role and contribution of animals to human physical and mental health (Fine, 2010; Mills & Hall, 2014; Purewal et al., 2017). According to relevant studies, Animal Assisted Intervention (AAI) programmes appear to benefit, among others, the psychological health of child, young, adult and elderly participants (Brelsford et al., 2017; Enders-Slegers & Hediger, 2019; McCune et al., 2020; Ormerod et al., 2005). Companion animals may attract children's interest and lift their mood through interaction during various activities (Fine, 2010; Jegatheesan, 2015) and help them get relief from daily stress, have fun and participate in team activities (Meints et al., 2022; O'Haire et al., 2013; Tardif-Williams & Bosacki, 2015). As far as dogs are concerned, the child-dog bond developed during interaction seems to assist the former to understand better the meanings of the notions of life and effort (Daly & Suggs, 2010; Morrow, 1998). Moreover, the presence of a dog in a school environment may contribute to making students feel less stressed, facilitate the process of learning and promote communication and cooperation among students (Abat-Roy, 2021; Katcher, 2002; Kruger & Serpell, 2010; Maujean et al., 2015; Triebenbacher, 1998). Dog Assisted Activity (DAA) programmes are an AAI category that appears to be beneficial to children as the programmes seem to contribute to the improvement of their psychological status (Brelsford et al., 2017; Endenburg & Baarda, 1995; Flynn et al., 2022).

The present study has had as a primary aim raising awareness and promoting understanding around the implementation of DAA programmes in primary education in Greece. According to the findings of research conducted in this field in other counties, these activities may help students to improve their general behaviour/attitude and psychological status in the school environment (Beetz, 2013; Meints et al., 2022; Miles et al., 2017). The hypothesis behind the present study is that student-dog interaction during the sessions of DAA programmes may improve students' depressive symptomatology. Elementary students are regarded as particularly sensitive in terms of their psychological status and mood. The main reason for this appears to be the challenging, and often stressful conditions these children have to deal with and confront during their transition into adolescence in the social, school and family environment (Chen, 2014; Lohaus et al., 2004; Pace et al., 1999; Wang et al., 2019). Therefore, the aim of the present research is to study the effect a DAA programme may have on elementary school students' depressive symptomatology.

2. Methods

According to the study's design, a depression score comparison was made within and between the control and the experimental groups, before and after the implementation of the DAA programme. The independent variables were: 1) the interaction of the experimental group students with a trained dog and 2) the control group students' attendance of a presentation on dog training. The dependent variable was the depression score, as measured using a standarised questionnaire. There were two points of measurement; before the implementation of the DAA programme (Time 0) and at the end of the programme (Time 1). The hypothesis of the study was that the students' physical interaction with a trained dog may affect their depressive symptomatology.

The research, which lasted approximately 2 months, was conducted during the delivery of a DAA programme, that took place in a private elementary school in the province of Attiki, Greece. The students participated on a voluntary basis (44 students, Year 5 and Year 6 Classes). The participants were randomly allocated to 2 groups: the control group (Group 1, n = 25) and the experimental group (Group 2, n = 19) by the school administration office. The number of participants in the experimental group could not be higher due to time constraints and relevant animal welfare guidelines.

A customised questionnaire titled: *Questionnaire regarding children's relationship, feelings and experience with dogs* was used for the collection of the participants' demographics and characteristics. The findings of this questionnaire are illustrated in **Table 1** below.

The young participants were administered the Children's Depression Inventory (CDI), (Kovacs, 1992) in their classrooms during a session that lasted for approximately 20 minutes. The CDI is a 27-item-self-reported symptom-oriented scale suitable for school-age youngsters and adolescents, aged 7 to 17 years. The final possible score ranges between 0 and 54 and is defined by the sum of the individual answers to each item. It quantifies several dimensions of depression including disturbed mood, hedonic capacity, negative functions, self-evaluation and interpersonal problems. Several items relate to the consequences of depression in contexts that are specifically relevant to children, such as the school context. This instrument has been constructed, revised and validated in the US by Kovacs (1985, 1992, 2008) possesses a good internal consistency (Cronbach's alpha = .71 to .89) and test-retest reliability. The factorial structure of CDI has been studied on a Greek sample of 1097 pupils, aged 10 to 13 years (Kleftaras & Alexopoulos, 2015; Kleftaras & Didaskalou, 2006). According to the principal-components factor analysis the factorial structure of this instrument, as it was found in the Greek sample, is satisfactory and confirms the results of previous studies. It contains a general factor and the Varmax rotations have given the expected factors.

The procedure for conducting the research was as follows:

Table 1. Students' demographics and characteristics.

Variables	Total	Experimental Group	Control Group
Age [in years (Mean ± SD)]	9.92 ± .59	9.73 ± .65	10.07 ± .52
Period of study in the present school [in years (Mean ± SD)]	3.43 ± 2.08	3.36 ± 2.61	3.48 ± 1.62
Sex [N (%)]			
Male	18 (40.9%)	9 (47.4%)	9 (36%)
Female	26 (59.1%)	10 (52.6%)	16 (64%)
Country of origin [N (%)]			
Greek	22 (50%)	12 (63.2%)	10 (40%)
Half Greek	16 (36.3%)	5 (26.3%)	11 (44%)
Foreign	6 (13.7%)	2 (10.5%)	4 (16%)
Would you like to meet a trained dog? [N (%)]			
Yes	27 (100%)	15 (100%)	12 (100%)
No	0 (32.3%)	0 (0%)	0 (0%)
Missing Values	17	4	13
Would you like to help train a dog to do a trick? [N (%)]			
Yes	27 (100%)	15 (100%)	12 (100%)
No	0 (0%)	0 (0%)	0 (0%)
Missing Values	17	4	13
Do you feel afraid when you meet a dog you do not know? [N (%)]			
Never	16 (59.2%)	7 (46.5%)	9 (75%)
Rarely	6 (22.2%)	4 (26.7%)	2 (16.7%)
Some of the time	3 (11.2%)	2 (13.3%)	1 (8.3%)
Most of the time	1 (3.7%)	1 (6.7%)	0 (0%)
All the time	1 (3.7%)	1 (6.7%)	0 (0%)
Missing Values	13	0	13
Have you ever been hurt by a dog, were you ever scratched or bitten, even if the dog did not mean to? [N (%)]			
Yes	10 (37%)	5 (33.3%)	5 (41.7%)
No	17 (63%)	10 (66.7%)	7 (58.3%)
Missing Values	17	4	13

Continued

Please mention any information regarding the child's behaviour during the interview that may help the study For example, was the child happy or upset when taking about the animals. If nothing significant, please write "O.K.". [N (%)]			
O.K.	11 (55%)	6 (50%)	5 (62.5%)
Happy	9 (45%)	6 (50%)	3 (37.5%)
Missing Values	24	7	17

M: Mean Value, SD: Standard Deviation.

Day 1: Completion of the depression questionnaire (Time 0).

Day 4: Completion of the demographics' questionnaire.

Day 8: First DAA session (experimental group) and 1st presentation (control group), each lasting 45 minutes. Ten sessions were held in total (1 session per week per group) over a period of 47 school days (2 calendar months approximately).

Day 75: Tenth session for each group. At the end of that session the students completed the Children's Depression Inventory questionnaire for a second time (Time 1).

During the programme/research, both groups attended the existing school daily schedule. All DAA sessions for both groups took place in the same room on the same day but at different times. The experimental group trained an already trained dog in a specific task, while the control group attended a presentation delivered by the researcher on the same topic as the dog training task. The Table 2 below provides information on the task/topic of each session for both the experimental and the control group.

Because of the nature of the study–child participants and animal (dog) involvement–particular emphasis was given to the ethical and health & safety issues that could affect either party (Winkle et al., 2020). The study obtained approval from the ethical committee of the university, ensuring among others compliance with the 2010/63/EU Directive of the European Parliament, which aims to protect animals used for scientific purposes. Moreover, the second researcher was an experienced and accredited clinical canine behaviourist/trainer, who had the knowledge to monitor and promote the dog's welfare. The researcher conducted risk assessments as appropriate and followed the existing Animal Assisted Interventions guidelines (AAII, 2023; IAHAIO, 2018; SCAS, 2019). Moreover, the researcher followed the school's guidelines and rules aligned to the existing national law on children's health and safety. Last but not least, the school's child psychologist was available upon request, in order to provide emotional support if necessary.

Table 2. Sessions' tasks/topics.

Session	Task/Topic
1st	Come
2nd	Heel
3rd	Sit
4th	Down
5th	Stay
6th	Jump
7th	Turn around
8th	Lay on side
9th	Touch
10th	Hi five

3. Results

The Statistical Package for the Social Sciences (SPSS version 29) was used to analyse the data. In order to assess the effect that the DAA programme may have on the students' depression, it was decided to make the following comparisons for both the control and the experimental groups:

Firstly, the depression within each group before and after the intervention was compared. The T-test, the Wilcoxon and Mann-Whitney tests were used for the correlated samples according to the even or uneven distribution of the data as appropriate (Table 3, Table 4 and Figures 1-3).

According to the results, there was no significant statistical change before and after the intervention on the depression of the control group (p value .895). The intervention in the experimental group had a significant statistical effect on the students' depression according to the scores measured before and after the DAA programme (p value .018).

Secondly, the depression scores that both groups achieved after the implementation of the intervention were compared. Moreover, the depression changes after the intervention for each of the two groups were compared. The Mann-Witney test was used due to uneven distribution of the data (Table 5, Figure 4 and Figure 5).

During the above comparisons it was revealed that there has not been any significant difference in either of the groups (p values: .838 and .179).

4. Discussion

The results of the study confirmed the hypothesis. The interaction with a trained dog during the DAA programme sessions seemed to have positively affected the students' depressive symptomatology. The comparison of the mean values between the control and the experimental group revealed that the interaction with

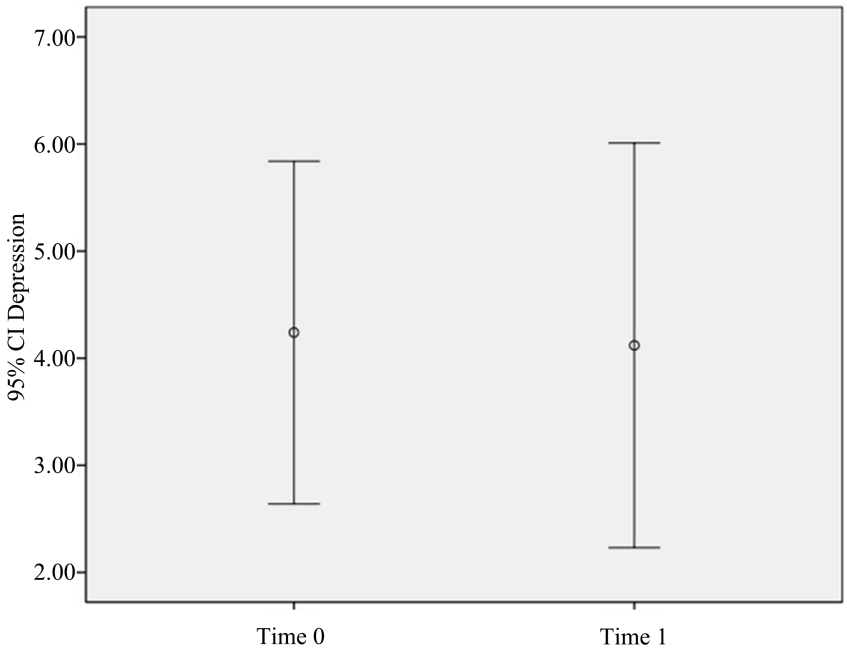

Figure 1. Group 1 error bar chart for depression before and after the intervention.

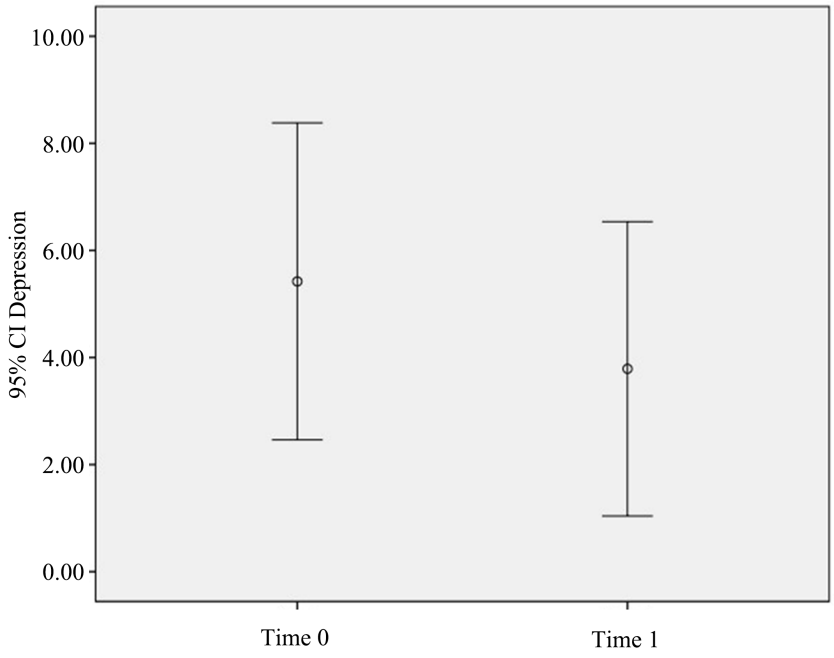

Figure 2. Group 2 error bar chart for depression before and after the intervention.

Table 3. Mean values comparison and standard deviations (±) for Group 1 (Wilcoxon test).

Group 1	Depression		*Z*	*p-value*
	Time 0	Time 1		
Group 1 depression before and after the intervention	4.24 ± 3.87	4.12 ± 4.57	−.132	.895

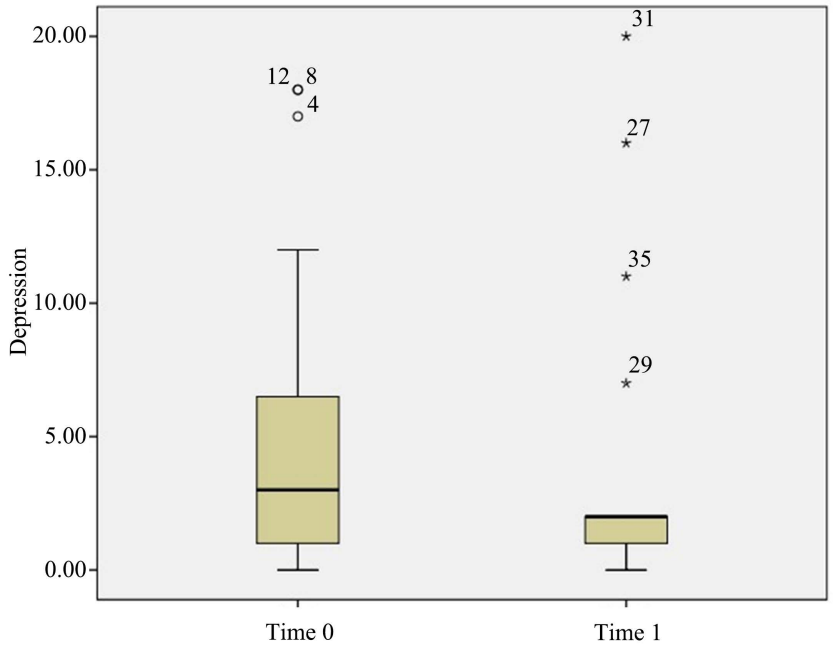

Figure 3. Group 2 boxplot for depression before and after the intervention.

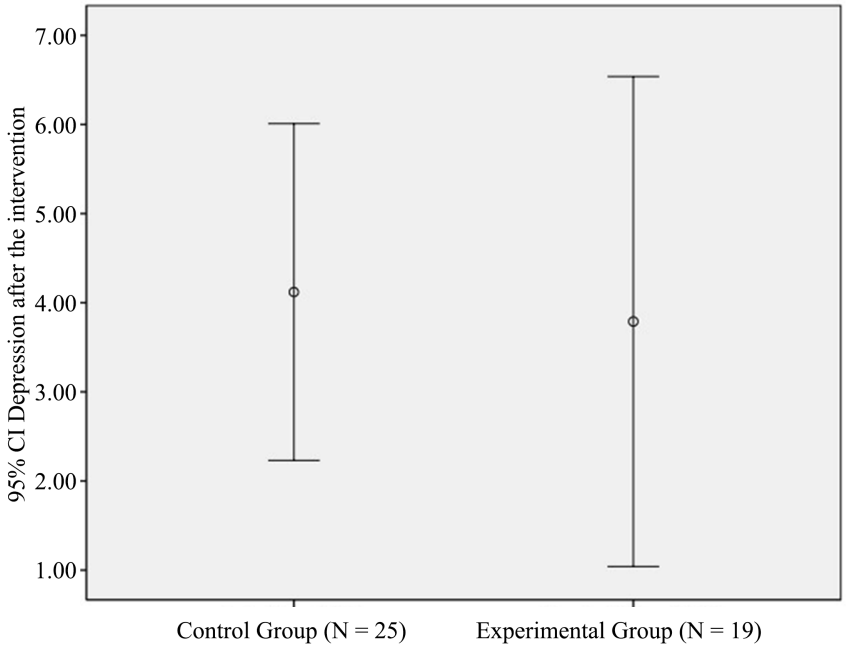

Figure 4. Group 1 & 2 error bar chart for depression after the intervention.

Table 4. Mean values comparison and standard deviations (±) for Group 2 (T-test).

Group 2	Depression		*t*	*p-value*
	Time 0	Time 1		
Group 2 depression before and after the intervention	5.42 ± 6.14	3.78 ± 5.70	−2.364	**.018***

*Statistically significant result (*p* value < .05).

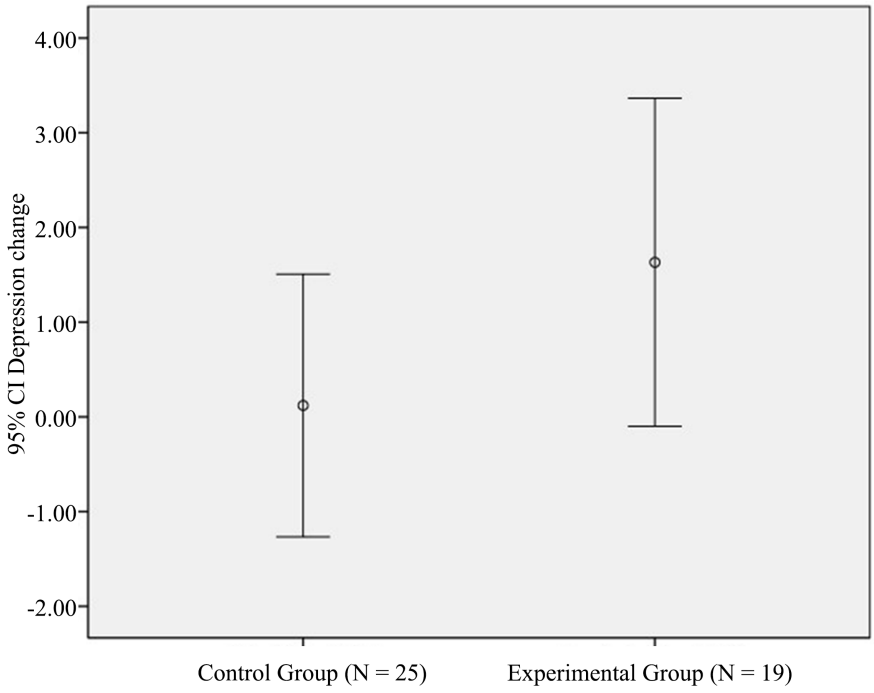

Figure 5. Depression change comparison for Groups 1 & 2 (error bar chart).

Table 5. Mann-Whitney test, between Groups' mean values comparison and standard deviations (±).

Comparisons	Depression		*U*	*p-value*
	Control group (N = 25)	Experimental group (N = 19)		
Depression after the intervention for each group.	4.12 ± 4.57	3.78 ± 5.70	229.000	.838
Depression change after the intervention for each group.	.12 ± 3.35	1.64 ± 3.59	181.500	.179

the dog may stand as an important element that may positively affect the students' depression symptomatology. These findings further support the results of previous studies in AAIs (Beetz, 2013; Brelsford et al., 2017; Reilly et al., 2020).

Relevant studies suggest there can be a wide range of reasons potentially affecting students' emotional mood and psychological status in the school environment. Among others, these can be the teacher's attitude and behaviour, the students' relationship with their teachers, and their relations with their family, classmates and friends (Bokhorst & Westenberg, 2010; Cambron et al., 2010; Harvey et al., 2022; Reilly et al., 2020; Rucinski et al., 2018; Sharaf et al., 2009). Keeping in mind the possible existence of all previously mentioned factors, it could be argued that the DAA programme may have also contributed to decreasing the students' depression.

The findings revealed that the students' interaction with a trained dog during the 10 DAA sessions, may have potentially helped to reduce feelings of sadness and loss of interest. The presence and interaction with a dog in the school environment seems to have benefited the students in the experimental group in comparison with the students in the control group, who attended dog training presentations delivered by the researcher. According to the existing literature in the AAI study and research, it could be argued that the present study's results further support the beneficial effects of dogs on children's psychological uplift and emotional wellbeing (Barker et al., 2016; Bert et al., 2016; Endenburg & Lith, 2011; Friesen, 2010; Ng et al., 2014; Parsons, 2004).

Kessler et al. (2012) and Valiente et al. (2020) argued that children attending the last year groups of elementary school may demonstrate an increase in stress levels and mood/emotional instability. The results of the present study have shown that a trained dog may act and be utilized as a motive for potentially promoting a better psychological status and so decrease the feelings of sadness and loss of interest. The student's interaction with a dog may provide a happy and stimulating activity that can also attract their interest. It is very possible that this interest and psychological uplift may stem from the innate and unintentional acceptance that dogs exhibit towards humans (Green, 2017; Kerns et al., 2023). A total acceptance is unaffected by humans' physical appearance, external characteristics, social behaviour, attitude, etc.

According to relevant research, children who overestimate their school abilities, in relation to that attributed to them by their teachers through assessments and evaluations are less likely to exhibit stress and depression in comparison to those children who underestimate their school abilities (Bouffard et al., 2011; Graham & Taylor 2022). Based on the findings of the present study the students' interaction with a dog during the training activities, could have helped them to better appreciate their abilities. Here, it should not be underestimated the fact that the dog was already trained beforehand, and this may also have contributed to eliminate any possibility of failure during the execution of the training tasks.

The researcher acknowledges that one possible limitation that may affect the generilisation of the results is the uneven number of participants in the control (n = 19) and the experimental (n = 25) groups. Based on present dog welfare guidelines it is suggested the interaction between the dog and the participants during a DAI programme should not exceed 45 minutes in each session (SCAS, 2019). This specific instruction determined the decision to form an experimental group consisting of 19 participants (2 minutes interaction with the dog for each participant).

The present study had two points of measurement; before and after the intervention. It is generally argued that there is insufficient evidence on the long-term effects of AAI programmes (Brelsford et al., 2017; Humphries, 2003; Wells 2019). As far as the present study is concerned, the school's curriculum did not leave any spare time to measure the effects of the DAA programme on the students' depression in the long term.

Another limitation on generalising the present results is that the research sample may not be representative of the Greek student population as a whole, as the study took place in a private school. Unfortunately, this school was the only one, among other private and public schools that replied positively to the researchers' proposal to participate in this research. Therefore, any result generilisation should be done with serious consideration of the above limitations, since the size and the distribution of the sample is neither large nor necessarily representative (Grové et al., 2021; Hüsgen et al., 2022; Mitchell, 2019; Wintermantel & Grove, 2022).

5. Conclusion

The findings of the present study suggest a relationship between the presence of a trained dog in the school environment and the depression symptomatology of elementary school students. The students' interaction with a trained dog may positively affect and improve the students' emotional state and mood. A dog's presence and a DAA programme in the school environment appear to play a possible positive role on student's psychological uplift. However, it should stand as an additional tool in a more holistic approach to improving students' psychological health rather than a panacea by itself. Based on the researchers' knowledge, the present study was the first conducted in Greece to measure the effects a DAA programme may have on elementary school student's depressive symptomatology. The researchers' vision was that this study could trigger other researchers to conduct relevant research in Greece. The researchers envisage for the future a wider sample, consisting of participants studying in both public and private schools in various Greek regions, which will give a better insight into DAA programmes' effects on the psychological health of elementary school students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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